

REMARKS

The Office Action dated December 17, 2010, has been received and carefully reviewed. The preceding amendments and the following remarks form a full and complete response thereto.

Previously withdrawn claims 1-17 and 34-48 have been canceled without prejudice or disclaimer. Claim 32 has been amended to correct a typographical error. No new matter has been added. Accordingly, claims 18-21, 23-33 and 49-57 are pending and are submitted for consideration.

Examiner Interview

Applicants and Applicants' representative, Martin Zoltick, wish to thank Examiner Mayekar for extending the courtesy of the interview held on March 7, 2010, and for the helpful and courteous discussions. Applicants and Applicants' representative believe that prosecution of the present application was materially advanced based on the discussion of the pending claims, the cited references and the pending rejections of independent claims 18 and 49 under 35 U.S.C. § 103(a). During the interview, Applicant and Applicant's representative "[s]howed the difference between the arrangement of holes in the [claimed] device and the prior art," as indicated in the Interview Summary. Applicants agreed to file a response setting forth those differences.

Objections to the Claims

The Office objected to claim 32 for containing the typographical error “W” in the phrase “passing W light.” To correct the typographical error, claim 32 has been amended to replace “W” with “UV.” Applicants respectfully request reconsideration and withdrawal of the objection.

Claim Rejections under 35 U.S.C. § 103

Claims 18-21, 23, 24 and 56

Claims 18-21, 23, 24 and 56 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2005/0008549 to Hsu (“Hsu”) in view of U.S. Patent No. 5,933,702 to Goswami (“Goswami”) and further in view of International Patent Application Publication No. WO 02/102497 to Kim (“Kim”). Applicants respectfully traverse the rejections and submit that claims 18-21, 23, 24 and 56 are patentable over the cited references.

Applicants respectfully submit that the rejection of claim 18 is improper because the cited references, alone or in combination, fail to teach or suggest each and every feature of claim 18. For example, none of the cited references teaches or suggests:

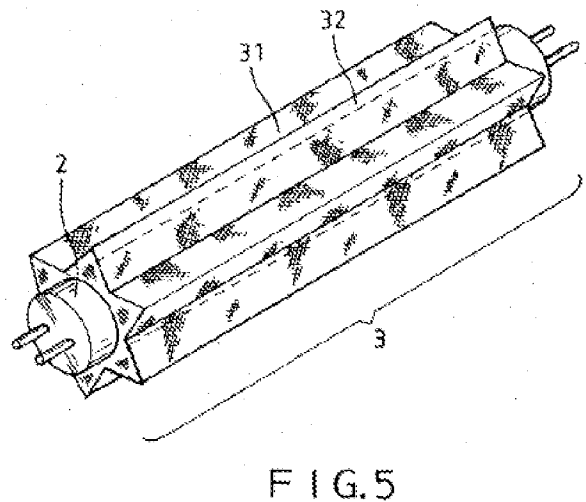
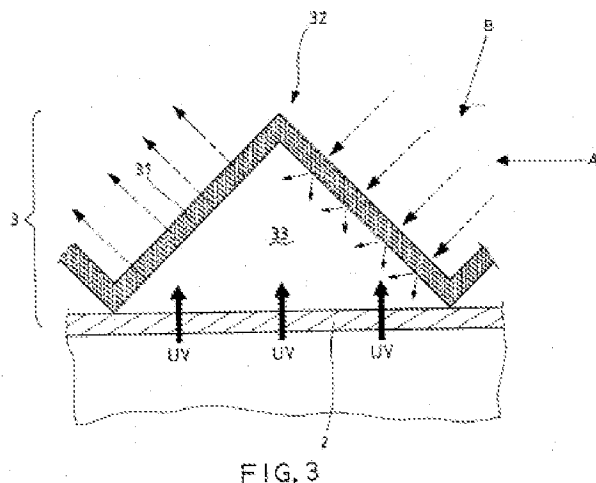
a one-piece catalytic target structure ... including:
a surface ... having a repeating V-shaped geometry comprising a plurality of V-shaped pleatings that generally surround a circumference of the ultraviolet light source, the plurality of V-shaped pleatings including:
(i) apexes formed by panels of the catalytic target structure that converge to point away from the ultraviolet light source and (ii) tips formed by panels of the catalytic target structure that converge to point towards the ultraviolet light energy source; and

a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels that form the apexes and the tips of the plurality of V-shaped pleatings;

as recited in claim 18. (emphasis added).

Hsu is directed to a photocatalytic lamp including a lamp body 2 and a photocatalytic covering 3 formed of a breathing base material 31 attached to the lamp body 2. A photocatalyst is mixed in or coated on the surface of breathing base material 31, and the breathing base material 31 covers the surface of lamp body 2. The photocatalytic covering 3 is shaped like a corrugated tube having a plurality of protruded flow guide portions 32. Each protruded flow guide portion 32 defines with the periphery of the lamp body 2 a flow buffer zone 33. The protruded flow guide portions 32 may extend in the axial direction and may be arranged in parallel around the periphery of the lamp body 2. See Hsu at Figs. 3 and 5 (reproduced below) and ¶¶ 0020-0025.

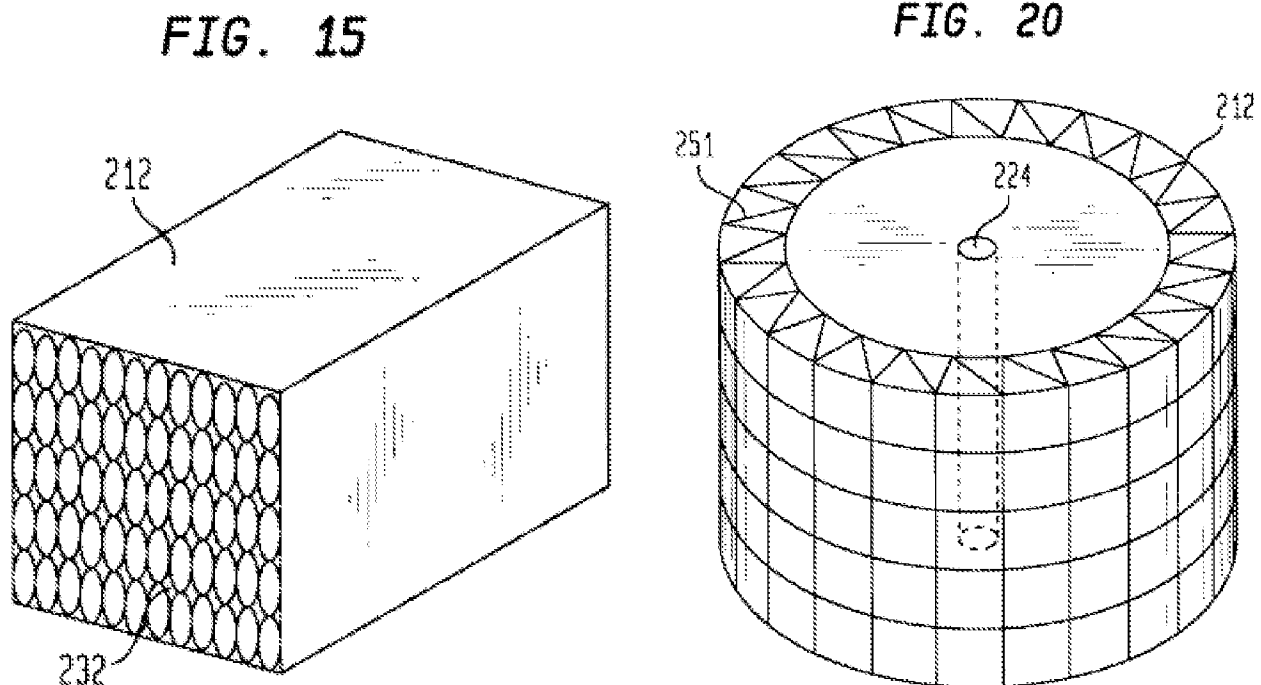
Figs. 3 and 5 of Hsu



Goswami is directed to a system for air disinfection by photocatalytic oxidation. In **one embodiment**, the system may include **circular** catalytic inserts 212 having a pleated surface 251

illuminated from the interior by UV lamp 224. *See* Goswami at Fig. 20 (reproduced below) and col. 11, lines 30-35. In an **alternative embodiment**, the system may include catalytic insert 212 having a **tubular** construction having circular or oval air passages 232. *See Id.* at Fig. 15 (reproduced below) and col. 11, lines 40-45.

Figs. 15 and 20 of Goswami



Kim is directed to an illumination apparatus for air purification using a photocatalyst. A photocatalyst is applied on an external surface of transparent member 63 for a photochemical reaction when radiated with ultraviolet rays radiated from ultraviolet ray source 61. Ultraviolet ray source 61 is mounted between a pair of supports 73, and both ends of transparent member 63 are supported by supports 73. *See* Kim at Fig. 5 and page 7, line 29-page 8, line 1.

In rejecting independent claim 18, the Office relies on the photocatalytic lamp shown in Fig. 5 of Hsu but acknowledges that “Hsu does not disclose the recited arrangement of the

holes.” Office Action at p. 3. The Office asserts that Goswami teaches a catalytic coated structure having circular air passages “arranged in rows” in Fig. 15. *Id.* Based on the teaching of Goswami, the Office asserts that “it would have been obvious to one having ordinary skill in the art at the time the invention was made to [modify] the apparatus of Hsu such that the air passage of the [photocatalytic covering of Hsu] has circular air passages arranged in rows.” *Id.*

However, Goswami teaches an embodiment having **circular** catalytic inserts 212 having a pleated surface 251 illuminated from the interior by UV lamp 224 and a **different, alternative** embodiment having a non-circular, **tubular** catalytic insert 212 having circular or oval air passages 232. *See* Hsu at Figs. 15 and 20 and col. 11, lines 30-35 and 40-45. In contrast to the claimed invention, it is the circular or oval air **passages 232** of Goswami, and not the rows of air passages 232, that extend in a **longitudinal** direction of the catalytic insert 212. *See Id.* at Fig. 15. The **rows** of air passages 232 extend linearly in a direction **perpendicular** to the longitudinal direction of catalytic insert 212. *See Id.* Accordingly, Goswami cannot reasonably be relied upon as teaching a plurality of holes “arranged in rows that extend linearly in a longitudinal direction,” as recited in claim 18.

Kim, which is relied upon for disclosing supports 73, also does not teach or suggest a plurality of holes “arranged in rows that extend linearly in a longitudinal direction,” as recited in claim 18. As none of the cited references, alone or in combination, teaches or suggests this feature, Applicants respectfully submit that the rejection of claim 18 is improper.

In addition, the cited references would not have led one of ordinary skill in the art to the claimed invention. One of ordinary skill in the art would understand the teaching of rows of

longitudinal air passages of Fig. 15 of Goswami to be **applicable to non-circular, tubular catalytic inserts and not to the circular inserts 212** of Fig. 20 of Goswami. Thus, one of ordinary skill in the art would understand the teaching of rows of longitudinal air passages of Fig. 15 of Goswami to be **inapplicable** to the photocatalytic lamp of Hsu shown in Fig. 5, which has a photocatalytic covering 3 having a plurality of protruded flow guide portions 32 that extend in the axial direction and are arranged in parallel around the periphery of the lamp body 2. Applicants respectfully submit that the rejection of claim 18 is improper for this reason as well.

Moreover, the rejections are improper because the proposed combination would not result in the claimed invention. The photocatalytic lamp of Hsu shown in Fig. 5 already has flow buffer zones 33 that extend in the longitudinal direction. Even if the flow buffer zones 33 of Fig. 5 of Hsu could somehow be arranged in rows according to the teachings of Goswami, it would still be the **flow buffer zones 33, and not the rows of flow buffer zones 33**, that extend in the longitudinal direction. Accordingly, the proposed combination would not have a plurality of holes “arranged in **rows** that extend linearly in a **longitudinal** direction,” as recited in claim 18. (emphasis added).

Applicants respectfully submit that claim 18 is patentable over the cited references and respectfully request reconsideration and withdrawal of the rejection.

Claims 19-21, 23, 24 and 56 are dependent, directly or indirectly, on independent claim 18 and are patentable over the cited references for the same reasons discussed above in regard to claim 18 as well as for the additional limitations they recite.

Claims 25-27

Claims 25-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsu in view of Goswami and further in view of Kim and further in view of U.S. Patent No. 6,063,343 to Say *et al.* (“Say”) and further in view of U.S. Patent No. 6,053,968 to Miller (“Miller”).

Applicants respectfully traverse the rejections and submit that claims 25-27 are patentable over the cited references.

Say is directed to a reactor that conducts photocatalytic conversion of contaminants in a fluid stream. The reactor may have a support fixture for the photocatalyst reaction that is a formed block 638 having one or more cylindrically shaped cavities 640 defined by a surface with one or more pleats 636 in approximately a star-shaped configuration. A light source 104 may be provided within cavity 640 so as to illuminate the entire surface of the pleats 636. The reactor may have sensors attached to indicators to warn a user when some or all of light sources become non-operational. *See Say* at Fig. 11; col. 7, line 54-col. 8, line 11; and col. 10, lines 14-18.

Miller is directed to a portable room air filter having a UV light status indicator 78. UV light status indicator 78 is a fiber optic cable that extends into interior chamber 22 and is optically shielded to prevent direct exposure to UV light. *See Miller* at Fig. 1 and col. 5, lines 41-46.

Claims 25-27 are dependent, directly or indirectly, on independent claim 18. Say and Miller fail to teach or suggest “a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels that form the apexes and the tips of the plurality of V-shaped pleatings,” as recited in claim 18. Therefore, Say and Miller fail to remedy

the deficiencies of the combination of Hsu, Goswami and Kim set forth above in regard to claim 18. Accordingly, claims 25-27 are patentable over the cited references for the same reasons discussed above in regard to claim 18 as well as for the additional limitations they recite. Applicants respectfully request reconsideration and withdrawal of the rejections.

Claims 28-33

Claims 28-33 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsu in view of Goswami and further in view of Kim and further in view of U.S. Patent No. 6,315,963 to Speer (“Speer”). Applicants respectfully traverse the rejections and submit that claims 28-33 are patentable over the cited references.

Speer is directed to a photocatalytic reaction enhancement device 10 installed within a UV reaction chamber 12 that houses a UV source 14. Speer at col. 6, lines 32-36. Speer discloses that the photocatalytic reaction enhancement device 10 includes a substrate 16 “folded in accordion-like fashion to form a plurality of panels 18 connected in series.” *Id.* at col. 7, lines 36-40.

Claims 28-33 are dependent, directly or indirectly, on independent claim 18. Speer fails to teach or suggest “a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels that form the apexes and the tips of the plurality of V-shaped pleatings,” as recited in claim 18. Therefore, Speer fails to remedy the deficiencies of the combination of Hsu, Goswami and Kim set forth above in regard to claim 18. Accordingly, claims 28-33 are patentable over the cited references for the same reasons discussed above in

regard to claim 18 as well as for the additional limitations they recite. Applicants respectfully request reconsideration and withdrawal of the rejections.

Claims 49-52 and 57

Claims 49-52 and 57 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsu in view of Goswami and further in view of Kim and further in view of Say and further in view of Miller. Applicants respectfully traverse the rejections and submit that claims 49-52 and 57 are patentable over the cited references.

Applicants respectfully submit that the rejection of claim 49 is improper because the cited references, alone or in combination, fail to teach or suggest each and every feature of claim 49. For example, for reasons explained above in regard to claims 18 and 25-27, none of the cited references teaches or suggests:

at least one single layer catalytic target structure ... having a repeating V-shaped geometry comprising a plurality of V-shaped pleatings that generally surround a circumference of the ultraviolet light source, the plurality of V-shaped pleatings including: (i) apexes formed by panels of the catalytic target structure that converge to point away from the ultraviolet light source and (ii) tips formed by panels of the catalytic target structure that converge and point towards the ultraviolet light energy source; and

a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels that form the apexes and the tips of the plurality of V-shaped pleatings;

as recited in claim 49 (emphasis added).

Accordingly, for the reasons explained above in regard to claims 18 and 25-27, Applicants respectfully submit that claim 49 is patentable over the cited references and respectfully request reconsideration and withdrawal of the rejection.

Claims 50-52 and 57 are dependent on independent claim 49 and are patentable over the cited references for the same reasons discussed above in regard to claim 49 as well as for the additional limitations they recite.

Claims 53-55

Claims 53-55 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsu in view of Goswami and further in view of Kim and further in view of Say and further in view of Miller and further in view of U.S. Patent No. 6,972,415 to Schaible *et al.* (“Schaible”).

Schaible is directed to a fluid treatment system 20 with a UV emitter 30, UV sensor 46 and intelligent driver 40. UV sensor 46 measures UV light emitted by UV emitter 40 and transmits the UV data to intelligent driver 40. Based on the UV data, intelligent driver 40 adjusts the power supplied to UV emitter 40 and/or generates an alarm. *See* Schaible at Fig. 1; col. 6, lines 42-65; and col. 7, lines 33-41.

Claims 53-55 are dependent, directly or indirectly, on independent claim 49. Schaible fails to teach or suggest “a plurality of holes ... arranged in rows that extend linearly in a longitudinal direction along the length of the panels that form the apexes and the tips of the plurality of V-shaped pleatings,” as recited in claim 49. Therefore, Schaible fails to remedy the deficiencies of the combination of Hsu, Goswami, Kim, Say and Miller set forth above in regard to claim 49. Accordingly, claims 53-55 are patentable over the cited references for the same reasons discussed above in regard to claim 49 as well as for the additional limitations they recite. Applicants respectfully request reconsideration and withdrawal of the rejections.

CONCLUSION

All of the stated grounds of objection and rejection have been properly traversed. Applicants therefore respectfully request that the Office reconsider all presently outstanding objections and rejections, and that they be withdrawn. Applicants submit that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account No. 02-2135.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

RESPECTFULLY SUBMITTED,					
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